RIL #3

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The first satellite trunks for traffic within the 48 contiguous States was put in service on July 23. The initial 7 trunk groups is relatively small and inconsequential but many more groups will be added over the next few years and the trunk quantities will amount to many thousands. With this new type of facility, serious transmission problems have been experienced. Basically it is due to the length of time it takes for voice grade signals to arrive at the distant end and also to loop back to the originator, delay and echo are probably the most common terms for the resulting difficulties.

A single trunk with satellite line facilities does not present much a problem to voice traffic but may seriously effect data transmissions. Two such trunks in a built up connection will degrade transmission to a point we feel even the voice subscribers will consider it as intolerable. As a result, measures must be taken to minimize the negative effects by preventing two satellite trunks in a single call and provide an alternative for data users.

The bulk of the problem is solved by using satellite facilities on high-usage, inter-regional trunk groups. Since only one of these is used on a call, two links in tandem will essentially be avoided.

Exceptions to this, that is types of traffic which might still encounter two or more satellite trunks, are conference calls; calls to Alaska, Hawaii, the Caribbean, and overseas. The recommended solutions involve new code assignments, restrictive and/or special routing. These are described in Attachment 1. Some traffic of this nature can not be restricted to one satellite link. i.e. conference calls established by the subscribers through various methods other than the conference operators and calls destined for overseas which originate overseas. For these we have no solution and subscribers must accept the degradation.

The problem of providing a means by which data users can be assured of a satellite free connection has been designated the Principal City (PC) plan and will used only as last resort, that is after data set adjustments, protocol changes, and/or programming changes have been attempted. Briefly, the plan calls for additional NXX codes in affected NPA(s). The NPA-NXX would be routed to the PC on terrestrial groups where the NXX is converted to the subscribers POTS NXX and routed to the subscribers regular line number. The data users method for beneficial avoidance of system satellites is covered in Attachment 2. The Inward WATS part of the plan calls for at least one additional NXX for each affected WATS state. These new codes would be routed terrestrially but would use the same 1XB as the existing NXX.

You will also find a document herewith attached (No. 3) written by Bill Doyle (LL - 201 885-2323) with suggested methods by which the special routing and screening may be implemented. Various types of switching system which might terminate satellite circuits are covered.

It appears that the best approach for the Routing groups would be to set up the various plans so that all the necessary routing in the network is established, but not necessarily activated for completion. On the conference call plan, the routing should be set up to deliver the traffic to the Regional Centers. The traffic will be routed to VCA there, until the necessary loop-around trunks have been installed. It would then depend wholly on when the operators are instructed to start the new procedure.

The Principal City plan should also be established as soon as possible so that when the need arises only the PC will be required to make the routing changes. The Inward WATS portion is basically established now but the terrestrial codes will have to be opened up at the originating screening offices. It is recommended that this also be done as soon as possible. delete

The discriminative routing of the codes for non-contiguous states and territories should be initiated whenever the possiblity of encountering a satellite trunk occurs.

The TRG will be revised to reflect the restricted routing of the various codes. The new listings will be maintained by Kansas City as long as the need exists.

W. B. Plossl
Supervisor - Network Trunk Administration

Attachment

Attachment 1

Tandem Satellite Link Avoidance Routing

Still effective

I. Conference Calls

A. It is ncessary to provide special measures by which the conference operators will be able to avoid encountering satellite trunks in setting up a conference call. Their instruction will be to dial normally (7 or 10D) for calls terminating within their home Region and Canada, and 191 + NPA (NPA is the NPA of the called party) for calls outside of the home Region (excluding Canada). In the 191 case, when the operator receives a tone (480 Hz) indicating that the equipment is ready, he/she keys and outpulses the second stage which is the standard 10D format for the called party.

B. The switching systems are to be programmed to route these 191 + NPA calls to the distant Regional center on terrestrial trunks.

1. For example, 191 + 704 is received by Newark 2 from the conference operator.

a. Newark 2 translates the 6D and routes the call to Rockdale (RCDLGATL41T) on terrestrial trunks. The call goes to Rockdale because 704 is in the Rockdale Region and on terrestrial trunks because 191 is the satellite avoidance code.

b. RCDLGATL41T receives 191 + 704 and routes to a loop-around trunk group. The second stage outpulsing tone is applied by the trunk equipment after the second sender attaches. The subsequent 10 digits outpulsed by the operator are then translated and routed in the normal manner to North Carolina.

2. If the NPA received from the operator at the originating switch is the home NPA of the distant Regional Center, the call should be directed to the home RC e.g. Newark 2 receives 191 + 404 the home NPA of RCDLGATL41T.

a. Call is routed to White Plains so that RCDLGATL41T is not forced into 6D translation of its own NPA. WHPLNY0201T 6D translates and routes the call to a loop-around trunk group where the 2nd stage outpulsing tone is applied after the second sender attaches. The operator then outpulses the 10 digits for the called party.

b. White Plains translates the received digits and routes on terrestrial facilities. The loop-around trunks used for this purpose must be class marked as satellite trunks so as to avoid satellite trunks.

3. Calls dialed in error to 191 + an NPA within the originating Region or Canada should be routed to VCA.

4. One Regional Center, the Dallas 4 ESS will not be capable of handling the second stage of outpulsing type of operation. Oklahoma City has been designated as the alternate for Dallas 4 ESS.

II. Traffic to and from locations outside the 48 contiguous States

A. Codes 011, 160, 182 thru 188 and NPA + 151 must never be routed to a satellite trunk terminating in the North American Network. OK

B. Cable control codes 157, 174, 177, 192, 193, 195, 196 and 199 should not be routed to a satellite trunk group except by the originating switcher located outside the 48 contiguous States that converts to the code. OK

C. Codes 808, 809, 907, 172, 175, 178, 179 and 197 should not be routed to a satellite trunk by any switcher in the 48 contiguous States unless the trunk group terminates within the NPA of destination. Switching systems outside the "48", may only route these codes on a satellite trunk group if the via switcher code converts to the appropriate cable control. OK

D. Calls coming in on satellite facilities destined for termination in the "48" should be screened from another satellite trunk at the gateway office. If the call overflows at the gateway, up chain to the home CSP; a dedicated group, class marked as a satellite trunk group, must be used between the two offices. Similar screening would then be required at the higher ranking office to prevent the possibility of selecting a satellite trunk there. This situation will probably occur at three places Jacksonville - Rockdale, New York - White Plains, Seattle - Sacramento. OK if not done by CCIS

Satellite Avoidance Routing - Principal City Plan

I. DDD Data Users

Several methods of avoidance routing have been proposed but the Principal City Plan appears to be the easiest and quickest to implement and therefore has gained the support of many. Basically, NXX codes will be assigned for terrestrial routing to the PC of each NPA from or to which satellite trunks might be encountered. These will be used as a second number by data users to improve their data transmission. Satellite avoidance will only be used as a last resort.

A. The selected codes will be removed from the vacant code list and added to the planned code list for routing to the PC of the NPA but only on terrestrial trunks. See III of this Attachment.

B. The PC will received 7D for home NPA.

1. 6D translate to determine the central office that serves that particular tens block.

2. code converts to the regular NXX and directs call to the proper central office.

3. subscriber retains the same line number if no tens block or line numbers conflict exists.

C. The PC will receive 10D for remote NPA.

1. 6D translates, skips 3 and routes to loop-around trunk group.

2. 6d translates again, to determine the tens block.

3. code converts to regular NXX and directs call to the proper central office.

4. the pseudo C.O. code must be unique in the NPA(s) served by that P.C. In other words a switching system which serves as PC for multiple NPA(s) must be able to identify the correct central office from the NXX and the tens block. The pseudo code used must not be assigned in any of the other NPA(s) for which it serves as P.C.

5. The pseudo code should be blocked from the network within the NPA in which the code is assigned.

D. If a tens block conflict occurs, the latest subscriber will undergo a number change.

E. A centralized control bureau will be established to handle the assignment of numbers and the coordination of their activation.

II. Inward WATA Data Users

These subscribers will also have the ability to communicate on a terrestrial only basis if all other "fixes" fail. This method is essentially the same as Inward WATS is today except that there will be additional another NXX(s) assigned and the routing of the new codes will be restricted to the earthbound type of facility. If the subscriber qualifies for the terrestrial only method, she/he will be given another number. For example, 800 241 1121 is the existing number, the new will be something like 800 364 1121. Everything else will be the same, even the 1XB.

A. The satellite avoidance NXX codes will be activated, translated, converted and routed in all originating screening offices (OSO) and through offices. The codes are listed in III of this Attachment.

B. The through offices and OSO when routing these codes directly on the trunk groups to the terminating screening offices will:

1. route only on the terrestrial subgroup and

2. send exactly the same 1XB as is now being sent.

C. The TSO will not have to do anything different in as much as it will receive nothing different than it does today for the same subscribers.

III. Data Users Satellite Avoidance Codes

NPA	SA NXX	Protected NXX	INWATS	SA INWATS
201	380		A) 631 B) 526	A) 254 B) 264
203	530		243	224

NPA	SA NXX	Protected NXX	INWATS	SA INWATS
212	890		A) 221 B) 223	A) 234 B) 244
215	354		523	246
216	260		321	373
217	995		637	283
218	940	930, 960	346	386
219	378		348	374
304	221		624	256
305	630	430	327	266
308	440	420, 360	445	497
309	996		447	273
312	990		A) 621 B) 323	A) 293 B) 274
313	990	999	521	294
317	624		428	384
319	470	460	553	296
402	420	440, 360	228	396
404	880		A) 241 B) 554	A) 364 B) 335
408	228		538	444
412	494	490	245	226
414	949		558	295
415	384		227	436
419	260		537	383
507	930	960, 940	533	376
513	690	570	543	377
515	460	470	247	286
517	999	990	248	275
605	250		843	434
606	570	690	354	324
608	992		356	427
612	960	930, 940	328	395

NPA	SA NXX	Protected NXX	INWATS	SA INWATS
614	260		848	393
616	998	997	253	285
701	890		437	385
712	360	440, 420	831	375
715	982		826	276
812	493		457	394
813	430	630	237	365
814	490	494	458	236
815	994		435	284
906	997	998	338	[redacted] 456

DOMESTIC SATELLITE
4A/4M ETS AND NO. 4ESS TOLL SWITCHING SYSTEM
SPECIAL ROUTING PROCEDURES

Section	Contents
1	General
2	Switching Machine Assignments 4A/4M and 4ESS
3	Service Observing
4	Trunk Servicing Considerations
5	Routing General
6	Restrictive Routing
7	Procedures at a 4A ETS/PBC with CCIS Generic Issue
8	Procedures at a 4A ETS/PBC with IRC Generic Issue 11 to CCIS General
9	Procedures at 4A ETS or 4A ETS/PBC with Generic Issue 8.1 to 10.0
10	Procedures at a No. 4ESS

1. GENERAL

1.01 These instructions describe the procedures to implement special routing considerations for selected NPA-NXX, NXX and System Codes to office variable data tables in the stored program control (SPC) and/or the peripheral bus computer (PBC) while operating with various Generic Programs.

1.02 It is suggested these procedures be filed with the Traffic Routing Guide, 4AETS and No. 4ESS Translation Guides. As existing practices are revised, portions of these procedures will be incorporated within the revised practices.

1.03 These procedures are to be used by the Toll Switching Machine Administrator, Routing and Maintenance groups for assignments, trunk and trunk group selection, service observing and trunk servicing in furnishing Message Telephone Service (MTS) by means of the GT&E-AT&T Domestic Sattellite System (COMSTAR).

2. SWITCHING MACHINE ASSIGNMENT - 4A/4M and 4ESS

2.01 Standard assignment procedures listed in Traffic Facilities Practices (TFP's), Dial Facilities Management Practices (DFMP's) and Bell System Practices (BSP's) for assingment of trunks to equipment for loading shall be followed in assignment of COMSTAR trunks at any given switching location.

4A/4M DFMP, Division H, Section 13
4ESS DFMP, Division H, Section 9
Translation Guides No. 4ETS and No. 4ESS.

2.02 Special Considerations for assignment at 4A/4M locations.

A. 4A Trunk relay equipments designated for COMSTAR service should be spread over as many Sender Link or Outpulser Frames as possible. COMSTAR trunks should not be assigned within the same Sender Link or Outpulser switch as its mate terrestrial trunk group.

B. COMSTAR trunks of any given trunk group should be spread over as many In and Out Link Frames as possible in a 4A machine. COMSTAR trunks should not be assigned within the same In or Out switch as its mate terrestrial trunk group.

C. In a 4A machine COMSTAR trunk groups should not be assigned within the same half of the trunk block connector as its mate terrestrial trunk group.

2.03 Procedures for determination of order of trunk selection within the COMSTAR trunk group are the same as for terrestrial trunk groups.

2.04 Selection of COMSTAR trunks, Low to High or High to Low or the equivalent, for switching locations will be determined by the CLLI codes. The lowest alpha CLLI code will select Low to High and the far end (High Alpha CLLI) High to Low.

2.05 Caution must be used in selections of trunks groups used for Key Reroutes. Routes selected must be those, which upon activation of the Key Reroute, will prevent possibility of double satellite connection.

3. SERVICE OBSERVING

3.01 Service Observing should be performed on satellite trunk groups following the same guidelines put forth on terrestrial trunk groups as covered in Current Service Observing Practices.

3.02 Observe on first choice incoming trunks between equal or higher ranking offices.

3.03 Rearrangement of trunks assigned to Service Observing - patch bay should be made every six (6) months to insure equitable observations.

4. TRUNK SERVICING CONSIDERATIONS

4.01 Satellite facilities have one way delay of approximately 300 msecs. CCITT recommendations (White Book-Vol. III Recommendation G.114) classify a circuit with 400 msecs. or more of one-way delay as unacceptable except in the most exceptional circumstances.

4.02 Various subjective tests have been made which attest to this recommendation. Not more than one satellite trunk should be permitted in any toll connection, domestic or overseas unless it qualifies as "most exceptional". Therefore the following restrictions apply to the use of domestic satellite circuits in the DDD Network:

A. No satellite assignments to any Final Trunk Group (Including RC to RC)

B. No satellite assignments will be made on intraregional high usage groups, except for cross-chain routing between chains in large geographic regions. (See Figure 1 and exceptions below for Hawaii, Alaska and the Caribbean).

C. Exclude domestic satellite circuits from all overseas gateways not equipped with ETS. When ETS is provided, class marks can be used to identify satellite circuits (domestic or international) in order to connect to terrestrial or cable, only.

D. Exclude domestic satellites from any full groups in routes which may carry overseas calls, including calls to Hawaii, Alaska, or 809.

4.03 COMSTAR trunks will be treated as a separate trunk group between any two points. COMSTAR trunks will have a distinct numbering plan to identify them from their mate terrestrial trunks between the same two points. The 9000 series in the trunks numbering scheme (BSP 682-100-018) has been reserved for this purpose.

4.04 The Current Circuit Administrator will use slightly modified procedures to handle message circuits which are candidates for satellite facilities.

4.05 Information pertaining to trunk groups, which will use satellite facilities, will be provided to the Current Circuit Administrators by the Area Facility Engineers. The information will indicate the type of facilities provided for a trunk group and their respective quantities. This data will be provided prior to preparing the Current Circuit Requirement List (CCRL).

4.06 Caution needs to be exercised in the sizing of the satellite portion of a trunk group. The following guidelines will be used.

A. At no time will the number of satellite trunks exceed 50% of the total number of trunks in the group.

B. New trunk groups will be assigned to terrestrial facilities if the group size is twelve or less. When the trunk group exceeds twelve circuits, then a 50-50 apportionment of satellite to terrestrial facilities will be observed.

C. If the trunk group size is an odd multiple of twelve circuits, the apportionment will be rounded in favor of terrestrial facilities.

4.07 The Current Circuit Administrator will prepare the CCRL each year that includes growth by trunk group. This information will be entered into Network Information System Traffic (NIST) by facility type. A separate identifier for satellite facilities is available for this purpose.

4.08 Circuit Layout will verify the availability of facilities and central office equipment, make assignments, and forward an offer to the Current Circuit Administrators. This offer will indicate satellite facilities and through the normal process the Machine Administrator will determine the availability of terminations.

4.09 Circuit numbers will be assigned to satellite trunks as follows:

9001-9599 Satellite - 2 Way
9601-9799 Satellite - 1 Way (A-Z)
9801-9999 Satellite - 1 Way (Z-A)

Note: Only the two-way portion of a trunk group will be assigned to satellite facilities in the Domestic network.

4.10 When using the Common Language Circuit Identification (CLCI), "SAT" will be used as the first three characters of the Trunk Type Modifier field. This will only be used for the satellite portion of the trunk group.

Example:

PH341TSAT BRPT0403TMMOJUSFLTL02T

4.11 When new trunk groups are established, T-306's will be issued to provide the trunk numbering and traffic routing. Two T-306's will be necessary. One T-306 will provide information on the terrestrial portion of a trunk group, with the overflow being directed to its mate satellite sub-group. The second T-306 will provide information on the satellite portion of the trunk group, and the overflow will then follow the normal traffic routing rules.

4.12 When issuing T-306's, data collection will be requested for both the terrestrial and satellite sub-groups. Peg Count, Overflow, and Usage will be required on both sub-groups.

4.13 Iff CCIS signaling is used for mixed satellite and terrestrial facilities, the CCIS data stream must use the facility with the least delay. That is, Voice Frequency Lines (VFLs) used to carry the CCIS Data stream will be routed over terrestrial facilities only.

Satellite Identification in NIS-T

Terminal A	Terminal B	Reqd	Ckts LL	Pend Action	First Adj
NEWYRK 4T NY FM	PHOENN 4A AZ	12	12		
NEWYRK 4T NY 2W	PHOENN 4A AZ	24	24		
NEWYRK 4T NY 2S	PHOENN 4A AZ	12			+12
NEWYRK 4T NY TO	PHOENN 4A AZ	12	12		
	SUBTOTAL	60	48		+12

Direction/Facility Codes for NIS-T

FM - One way from terminal Z, terrestrial facilities

FS - One way from terminal Z, satellite facilities

2W - Two way, terrestrial facilities

2S - Two way, satellite facilities

TO - One way to terminal Z, terrestrial facilities

TS - One way to terminal Z, satellite facilities

5. ROUTING GENERAL

5.01 COMSTAR trunks will be treated as a separate trunk group between two points. COMSTAR trunks will have a distinct numbering plan to identify them from terrestrial trunks between the same two points.

5.02 At 4A ETS and 4A ETS/PBC locations COMSTAR trunk groups will be assigned a different screening class mark than the screening class marks assigned terrestrial trunk groups. At any given switching location the same screening class marks will be assigned to all COMSTAR trunk groups. Terrestrial trunk groups must never be assigned the same screening class mark assigned the COMSTAR Trunk Group. This is done to prevent double satellite connections. (See Figures 1-4).

5.03 At 4A ETS/PBC locations with Generic 11 (Intagrated Recent Change Generic) screening of Incoming trunk groups to outgoing trunk groups to prevent a double satellite hop may be performed by setting word bits in the Incoming Trunk Group Table (ITKTAB) and the Outgoing Trunk Group Table (OTKTAB).

5.04 4A ETS locations with Common Channel Interoffice Signaling (CCIS) Generics have been conditioned to accept satellite indicators via Form Codes B01. (Incoming Trunk Group Record), B04. (Outgoing Trunk Group Record non-CCIS) and B43 (CCIS Outgoing Trunk Group Record). The satellite yes or no indicator permits screening for double satellite connection via the Generic program without use of Incoming and destination code screening.

5.05 Proposed, alternate routing plans for COMSTAR trunks Domestic Traffic at and given switching location are:

A. Calls incoming to a switching location via terrestrial facilities will first select a terrestrial trunk group outgoing. If the terrestrial trunk group is full then overflow or route advance to the mate COMSTAR trunk group - and so on through the routing chain, first selecting the terrestrial trunk group and overflow or route advancing to the mate COMSTAR group until the final trunk group is accessed, should all intermediate routes be busy.

B. Calls incoming from COMSTAR trunks to outgoing trunk will first access a terrestrial group and route advance through the routing chain selecting only outgoing terrestrial trunk groups.

C. While most traffic should be routed first to the terrestrial subgroup and then to the satellite subgroup in all trunk groups (so equipped) that it encounters, other traffic must avoid satellites entirely.

5.06 Calls Transiting the U.S. Mainland between Alaska/Hawaii/NPA809/ International Overseas.

A. The possibility of three satellite connections in tandem exists in these cases. There are several ways of prevnting this, but certain methods are easier to implement than others, depending upon the origin and destination of the call. Figure 2 illustrates the various types of calls and is based upon recommendations of the Bell Laboratories Toll Switching Systems group. Note, that in all cases except one, the satellite link is permitted on either originating or terminating overseas link but not on the domestic link. Also, this method relies, in most cases, on translation at the originating point: code conversion requirements are kept to a minimum.

B. Calls between NPA's 808 or 809 and intra-Alaskan satellite Class 5 offices should avoid any satellite facilities in the toll connections, permitting the one link to the Alaskan Class 5 offices. Calls from other overseas points should, when possible, follow similar rules; however, in certain cases (e.g., calls to and from certain South American locations) two hops are unavoidable. However, code conversion, at the incoming international switch, to cable only codes will at least prevent three satellite links in the connection.

5.07 Calls between Mainland U.S. and Alaska/Hawaii/809 (See Figure 2)

A. From Alaska/Hawaii/809 NPA to Mainland U.S.
Since there are not enough codes available to furnish mate codes for each NPA at which domestic satellite facilities may terminate, the off-shore locations must translate and select terrestrial routes to the mainland on calls destined for domestic satellite NPA's. This permits either a terrestrial or satellite facility for the terminating link.

B. A special case arises in the situation where a call originates from one of the Intra-Alaska Satellite Class 5 offices (point Z in Figure 2). These calls must be routed via Anchorage to Seattle on terrestrial facilities and complete to the mainland NPA via Seattle/Sacramento. Since there will be no domestic satellite facilities at Seattle, calls completing out of that office will be routed terrestrially. Overflow traffic routed to Sacramento could encounter a second satellite link and this will have to be considered an "exceptional circumstance" until such time (1976-1977) as CCIS is available between Seattle and Sacramento.

5.08 From Mainland U.S. to Alaska/Hawaii/809 NPA-

A. As is indicated in Figure 2, calls destined for 907/808/809 NPA's which originate in NPA's terminating satellite trunk groups will employ translation to select terrestrial facilities in the domestic network, permitting completion via either satellite or cable to the off-shore point.

B. An exception to this rule occurs when a call is destined for a Class 5 Office in the intra-Alaska Satellite Network. These calls should be routed to Anchorage via a Seattle-Anchorage terrestrial facility; six-digit translation is required to treat calls of this type. This procedure must be followed even at office having high-usage satellite facilities to Alaska.

5.09 Incoming Overseas Calls

A. Incoming calls from overseas can arrive at any of the present seven ISC's on either satellite or cable. Domestic satellite circuits should not terminate at those INC's not equipped with ETS. ETS class marks available on the overseas trunks will prevent double satellite connections in the same office. See Figure 3 for the general RC/ISC case.

B. White Plains is at present the only ETS regional center on which a non-ETS ISC homes. If domestic satellites are terminated at the White Plains Regional Center, it will be necessary to provide a separate trunk group to carry incoming overseas traffic from the ISC to the RC. (Figure 4 illustrates a possible arrangement for White Plains-New York City assuming satellite circuits are terminated at New York 7.) This arrangement may also be applicable to the Jacksonville-Rockdale and Sacramento-Seattle homing ISC's.

5.09 Incoming Overseas Calls (Cont'd.)

C. Incoming overseas calls at a non-ETS U.S. gateway destined for Hawaii, Alaska, or the Caribbean Areas can be directed by wired logic in the 4A/4M overseas sender to select "cable only" to those points.

5.10 Outgoing Overseas Calls

A. In addition to other possible applications, domestic, satellite circuits may be terminated at ETS gateways or ETS RC's. In the latter case, "call-back" traffic routed up-hill from the gateway must be on dedicated one-way trunks and classmarked as "satellite" at the RC. TORC should be prohibited on class-marked traffic.

B. ISSS, IOTC and "no hang-up" traffic should make use of translation of "1XX" and "160" + "XXX" codes to select domestic terrestrial routes only. At present, "1XX" is being replaced by "011 + XXX"; therefore, translation of "011" will be required instead of "1XX".

C. When both gateway and its RC are ETS-equipped and CCIS is provided, the special arrangements can be eliminated, since traveling class marks can be used.

5.11 Conference Calls

A. Operator handled conference calls should be restricted to terrestrial routing. The proposed method utilizes code 191 in conjunction with modified overseas loop-around trunks (SD-68575, domestic options applied) at each Regional Center.

B. When the conference operator establishes the conference call, conferees in the home region are reached in the normal manner. However, conferees in NPA's which could be accessed with domestic satellite facilities are reached using restrictive routing procedures as detailed in paragraph 6.06.

6. RESTRICTIVE ROUTING

6.01 The bulk of the problems will be disposed of by establishing these satellite trunk subgroups in only high usage, inter-regional trunk groups. There will not be any established in final groups nor within a region except between Alaska, Hawaii, the Carribbean and the contiguous 48 states.

6.02 At locations which terminate satellite trunk groups or trunk subgroups from outside the 48 contiguous States, it will be necessary to screen calls incoming on satellite trunk groups or trunk subgroups to prevent connection to another satellite trunk group or trunk subgroup. If this same traffic is alternate routed up the home chain, trunk groups that are class marked in

the distant office as satellite, see paragraph should only be used. In effect, it is a traveling class mark passed along by means of the trunk groups used. Such "dedicated" trunk groups or subgroups will be required between such points as Jacksonville and Rockdale, Seattle and Sacramento, New York 10 and New York 4&7, New York 4&7 and White Plains, in short, any place where calls coming off satellite trunks might be offered to another satellite trunk via another intermediate switch.

6.03 Trunk groups or trunk subgroups established between "gateway" type offices and their home CSP(s) for final routed traffic received from a satellite trunk group or trunk subgroup, should be class marked as if it were a satellite trunk to preclude connection to another satellite trunk group or trunk subgroup at the higher ranking office. (See Figure 4)

6.04 Certain codes should never be offered to a domestic satellite trunk group, that is, one of which both terminals are located in the North American Network. These codes would normally be those involved in overseas traffic such as 011 and the 182 through 188 series.

A. Received Codes	Disposition
011, 160, 182, 183, 184, 185, 186, 187, 188, 191, NPA + 151 Code as Non-rerouteable Traffic (NRRT)	Do not route to any satellite trunk group or trunk subgroup terminating in the North American Network

6.05 Other codes can be offered to satellite trunk groups but only under specific conditions. These codes, such as 808, 809, 907, should be routed on terrestrial trunk groups up to the last toll office in the 48 contiguous states. This office will then have full range of completion capabilities looking at both satellite and cable trunk groups. In cases where calls originate in Alaska, or Hawaii, or the Carribean for those same NPA(s) it is permissible to route on satellite trunks at the originating end only if code conversion to the cable control code is used.

A. Received Codes	Disposition
157, 172, 174, 175 177, 178, 179, 192 193, 195, 196, 197 199, 808, 809, 907 Code as Non-rerouteable traffic (NRRT)	(1) Switching offices in the contiguous 48 states do not route to any satellite trunk group or trunk subgroup unless the satellite trunk group or trunk subgroup terminates in the NPA of destination (2) Switching offices in Alaska, Hawaii or the Caribbean route to a satellite trunk group or trunk subgroup only if conversion to cable only codes is employed at that office or by the next via office as described in section 9 of the Traffic Routing Guide

6.06 Conference Calls

To avoid encountering satellite trunks, the operators will be required to dial a special code (191 has been assigned for this purpose) and two stages of out pulsing for calls outside their home region. For calls within the home region, regular 7D or 10D dialing will be employed.

A. The toll switching system receiving 191 + NPA (NPA of destination) from the conference operator:

1) Six digit translates and routes. 191 indicates terrestrial trunks only and the NPA indicates the Class 1 (RC) office to or towards which the call will be sent.

2) Each Class 1 (RC) will handle calls to all NPA(s) within its region except the one in which it is physically located. This is done to avoid forcing a Class 1 (RC) to 6D translate its home NPA, calls to these NPA(s) should be routed to the RC of the originating chain.

3) Calls dialed in error to 191 + NPA in the originating region should be routed to VCA.

B. Regional Centers will receive the 191 + NPA and route to a "loop-around" trunk, which will attach another sender. This sender returns an indication to the operator to commence the second stage of outpulsing i.e., NPA + 7D. The "loop-around" trunks will be marked with an incoming trunk class the same as satellite trunks to avoid the possibility of encountering a satellite trunk out of the RC.

C. Intermediate or through switchers will route in accordance with the guidelines in 6.05A above.

6.07 Section 9 of the Traffic Routing Guide will be modified to list codes and guidelines/rules to be followed. Subsection 9(d) will be used for this purpose with the index and 1.3 sections revised to reflect the changes.

7. PROCEDURES FOR RESTRICTIVE ROUTING OF SELECTED CODES AT 4A ETS/PBC WITH CCIS GENERIC - Division 3B of the 4A/ETS Translation Guide

7.01 Establish satellite circuits as a separate trunk group or trunk subgroup from 1-Way/2-Way terrestrial trunk groups or trunk subgroups between the A and Z office.

A. Use the same 11 character CLLI code on the satellite trunk group or trunk subgroup as designated for the mate terrestrial trunk group or trunk subgroup between the A and Z office.

B. Assign a suffix different than the suffix assigned to the mate terrestrial trunk group or trunk subgroup between the A and Z office.

C. Assign a distinct incoming screening class to all satellite trunk groups or trunk subgroups. This screening class must not be used for any other trunk group or trunk subgroup. Tandem satellite connections are prevented by proper coding of Form Codes B01 and B04 (SAT column) as satellite yes.

D. On non-CCIS terrestrial/satellite trunk groups or trunk subgroups assign separate GB relays to the terrestrial and satellite trunk groups or trunk subgroups between the A and Z offices.

1) A separate B01 Form Code must be prepared for the terrestrial and satellite trunk groups or trunk subgroups between the A and Z offices.

2) A separate B04 Form Code must be prepared for the terrestrial and satellite trunk groups or trunk subgroups when the combined 1-Way/2-Way terrestrial trunk group or trunk subgroups utilizes both the A and B rank (Col. 29-30) of the B04 Form Code. (Example A)

Example A (B04 - Form Code)

(Terrestrial)	Suffix (28)	Rank (29-30)	Register (32)	(Note 1) NETC (33)	VSK/CC (34)
1-way	0	0A	F	F	F
2-way	1	0B	L	I	I
(Satellite)					
2-way	2	1A	S	L	L

3) When the combined 1-Way/2-Way terrestrial trunk group or trunk subgroup are contained within one rank, for example Rank A, and the terrestrial circuit growth is not expected to exceed the requirement of a single rank the satellite trunk group or trunk subgroup may be placed in the B Rank. (Example B)

Example B (B04 - Form Code)

(Terrestrial)	Suffix (28)	Rank (29-30)	Register (32)	(Note 1) NETC (33)	VSK/CC (34)
1-way	0	0A	F/L	F	F
(Satellite)					
2-way	1	0B	S	L	L

Note 1: NETC Col. 33 may be coded to permit separate network management controls on the terrestrial and satellite trunk groups or trunk subgroups.

4) A separate A43 Form Code must be prepared for the terrestrial and satellite trunk group or trunk subgroups between the A and Z offices. (Example C)

Note: 1-Way/2-Way terrestrial trunk groups or trunk subgroups may be combined on the same A43 Form Code if desired. (Example D)

Example C (A43 Form Code)

	Out Suffix (42)	Rank (46-47)	VSK (48)	(Note 2) Net (49)	Reg (50)	In/Suffix (59)
(Terrestrial)						
1-Way	0	OA	F	F	F	
2-Way	1	OB	I	I	L	7
(Satellite)						
2-Way	2	1A	L	L	S	6

Example C (A43 Form Code)

	Out Suffix (42)	Rank (46-47)	VSK (48)	(Note 2) Net (49)	Reg (50)	In/Suffix (59)
(Terrestrial)						
1-Way/2-Way	0	OA	F	F	S	7
(Satellite)						
2-Way	1	OB	L	L	S	8

Note 2: NET Col. 49 may be coded to permit separate Network Management controls on the terrestrial and satellite trunk groups or trunk subgroups.

5) Separate A05 Form Codes must be prepared for each B04 or A43 Form Code prepared specifing those codes which may route terrestrial/satellite and those codes designated as requiring restrictive routing to select only terrestrial trunk groups or trunk subgroups.

6) 02A-C and 03A-C Form Codes must be revised and recent changes prepared to reflect routing of those codes requiring restrictive routing.

7) Separate Peg Counts, Overflow and usage measurements will be made for the terrestrial and satellite trunk groups or trunk subgroups.

7.02 CCIS and Non-CCIS Trunk Groups or Trunk Subgroups (Incoming)
In the ETS/SPC data table for Incoming Trunk Group Table (ITKTAB) - Form Codes B01 and A43 set BIT 6 of each ITKTAB word for the incoming satellite trunk groups or trunk subgroups to one (1). BIT 6 of each ITKTAB word for terrestrial trunk groups or trunk subgroups must be set to zero (0). (See note 3)

7.03 CCIS and Non-CCIS Trunk Groups or Trunk Subgroups (Outgoing)
In the ETS/SPC data tables for Outgoing Trunk Groups Table (OTKTAB) - Form Code B04 and A43 set BIT one (1) of the first word (Word 0) to one (1) of each OTKTAB word for the Outgoing satellite trunk groups. BIT one (1) of the first word (Word 0) of each OTKTAB for terrestrial trunk groups must be set to zero (0). (See note 3)

Note 3: If form codes are being prepared for a CCIS Decompile/Recompile and preplan for new trunk groups or trunk subgroups contain satellite trunk groups or trunk subgroups which are not due for turn up until after the CCIS Generic has been loaded the BIT setting is accomplished by marking the SAT column of the B01, B04 and A43 Form Codes for these groups.

CAUTION: Make sure Bit 6 of the ITKTAB and Bit 1 of the first word in OTKTAB on all other non-satellite trunk groups or trunk subgroups are set to zero (0). If these bits are left setting on one (1) non-satellite trunks interconnection of incoming trunk (ITKTAB) set to one (1) will not be made to outgoing trunk group or trunk subgroups set to one (1).

7.04 Insure BIT fifteen (15) in each word of the follwing tables is set to zero (0). If this BIT is other than zero (0) it is possible codes associated with these tables will have only partial trunk group access or not be routed at all.

ACPPY	(Note: 4)	Area Code Primary Instruction Table.
NACPRY	(Note 4)	Non-Area Code Primary Instruction Table.
GCP		Code Grouping Table
SCR		Screening Table

Note 4: This applies only to standard 3-digit translation ACPRY and NACPRY tables.

7.05 ACPRY/NACPRY (Standard 3-digit translation)
Reset BIT fifteen (15) of each word in either the ACPRY or NACPRY table associated with the designated 3-digit code(s) requiring restrictive routing to avoid satellite trunk groups.

7.06 CGP-6 Digit Translation (NON-Screening Entry Only)

6-Digit translation Code Grouping tables associated with the designated 6D codes requiring restrictive routing to avoid satellite trunk groups or trunk subgroups and screening is not used should be set up as follows:

A. When selected codes designated as requiring restrictive routing to avoid satellite routes appear in a 6 Digit CGP table:

1. Establish a new code grouping word for each treatment of each NPA which contains codes requiring restrictive routing for which 6D translation is performed. Set BIT fifteen (15) of the new CGP word to one (1). There are now two (2) CGP words established for each treatment of each NPA involved and must apear exactly alike except for BIT fifteen (15) of the new CGP word established.

2. In the 6-digit grid of the NPA for which a new CGP word has been established, reset the CGP word pointer of each NXX code, designated for restrictive routing, to point to the new CGP word or words established depending upon treatments of the affected NPA.

B. When all codes in a 6-digit Grid are designated as requiring restrictive routing (For Example: 011):

1. Set BIT fifteen (15) of the existing CGP word currently established for the affected NPA to one (1).

7.07 SCR - 6D or 3D Screening Tables (Screening Entry only)

A sixteen (16) word screening table may be provided per 3-digit code, per 6-digit code or per grouping of 3 or 6-digit codes.

A. 3D or 6D Code Screening Tables - SELECTED CODES designated to avoid satellite groups.

1. When selected codes designated as requiring restrictive routing to avoid satellite trunk groups or trunk subgroups appear in existing 3 or 6 digit screening tables they must be removed from these tables and new screening tables established for these codes.

2. Establish a new 3 or 6 digit screening table or grouping of 3 or 6 digit screening tables for the codes designated as requiring restrictive routing to avoid satellite trunk groups or trunk subgroups. Set BIT fifteen (15) of each word in these new tables to one (1).

B. 3D or 6D Code Screening Tables - ALL CODES are designated as requiring restrictive routing to avoid satellite trunk groups or trunk subgroups.

1. When all codes appearing in an existing 3D or 6D screening tables or grouping of 3D or 6D screening tables are designated to be kept off satellite trunk groups or trunk subgroups set BIT fifteen (15) of each word in the existing screening tables to one (1).

7.08 A Generic overwrite for the CCIS generic issue will be provided by Bell Telephone Laboratories. This overwrite is required to activate the procedures implemented in the previous paragraphs to provide satellite avoidance routing of designated codes.

The Generic overwrite should be input at this time.

7.09 It is anticipated the overwrite for special routing of selected codes will be included in later point issues of the CCIS generic and carried through the Decompile/Recompile process. Until this process is implemented manual manipulation of the various tables and BIT settings will be required.

8. PROCEDURES FOR RESTRICTIVE ROUTING OF SELECTED CODES AT 4A/ETS/PBC WITH INTAGRATED RECENT CHANGE GENERIC - ISSUE 11

8.01 Establish satellite circuits as a separate trunk group or trunk subgroup between the A and Z office.

A. A separate B01 Form Code must be prepared for the terrestrial and satellite trunk groups or trunk subgroups between the A and Z office.

B. Use the same 11 character CLLI code on the satellite trunk group or trunk subgroup as designated for the mate terrestrial trunk group or trunk subgroup.

C. Assign a suffix different than the suffix assigned to the mate terrestrial trunk group or trunk subgroup between the A and Z office.

D. Assign a distinct incoming screening class to all satellite trunk groups or trunk subgroups. This screening class must not be used for any other trunk group or trunk subgroup. Tandem satellite connections are prevented by proper coding of Form Codes B01 and B04 (SAT column) as satellite yes.

E. Assign separate GB relays to the terrestrial and satellite trunk groups or trunk subgroups between the A and Z office.

1. A separate B04 Form Code must be prepared for the terrestrial and satellite trunk groups or trunk subgroups when the combined 1-way/2-way trunk group or trunk subgroup utilizes both the A and B (Col. 29-30) of the B04 Form Code. (Example D)

Example D (B04 Form Code)

	Suffix (28)	Rank (29-30)	Register (32)	NETC (33)	(Note 4) VSK/CC (34)
(Terrestrial)					
1-way	0	0A	F	F	F
2-way	1	0B	F	I	I
(Satellite)					
2-way	2	1A	S	L	L

2. When the combined 1-way/2-way terrestrial trunk group or trunk subgroups are contained within one rank, for example Rank A, and the terrestrial circuit growth is not expected to exceed the requirement of a single rank the satellite trunk group or trunk subgroup may be placed in the B Rank. (Example E)

Example E (B04 Form Code)

	Suffix (28)	Rank (29-30)	Register (32)	(Note 5) NETC (33)	VSK/CC (34)
(Terrestrial)					
1-way/2-way	0	0A	F/L	F	F
(Satellite)					
2-way	1	0B	S	L	L

Note 5: NETC Col. 33 may be coded to permit separate network management controls on the terrestrial and satellite trunk group or trunk subgroup.

3. Establish a pseudo trunk group or trunk subgroup entries for the existing terrestrial trunk group or subgroup using the same GB relay and Trunk Block Connectors currently assigned to the existing trunk group or trunk subgroup.

4. Prepare a separate B04 Form Code for the pseudo trunk group using the same CLLI as the working trunk group or trunk subgroup and assign a suffix different than the suffix currently assigned to the working terrestrial/satellite trunk group or trunk subgroup. (See Figures 6, 7 and Example F)

Example F (B04 Form Code)

	Suffix (28)	Rank (29-30)	Register (32)	(Note 6) NETC (33)	VSK/CC (34)
(Terrestrial)					
1-way	0	0A	F	F	F
2-way	1	0B	L	I	I
(Satellite)					
2-way	2	1A	S	L	L
(Pseudo Terrestrial)					
1-way	3	0A	F	F	F
2-way	4	0B	L	L	L

Note 6: WETC Col. 33 may be coded to permit separate network management controls on the regular terrestrial and satellite trunk group or trunk subgroup.

8.02 Terrestrial/Satellite trunk groups or trunk subgroups (Incoming)
In the ETS/SPC data tables for the Incoming Trunk Group Table (ITKTAB) - (Form Code B01) set BIT 6 of each ITKTAB word for the incoming satellite trunk group or trunk subgroup to one (1). BIT 6 of each ITKTAB word for the terrestrial trunk group or trunk subgroup must be set to zero (0). (See note 7)

8.03 Terrestrial/Satellite trunk group or trunk subgroup (Outgoing)
In the ETS/SPC data tables for the Outgoing Trunk Group Table (OTKTAB) (Form Code B04) set BIT one (1) of the first word (Word 0) to one (1) of each word for the outgoing satellite trunk groups or trunk subgroups one (1) of the first word (Word 0) of each OTKTAB for the terrestrial trunk groups or trunk subgroups must be set to zero (0). (See Note 7)

(Note 7): If form codes are being prepared for a PBC or a CCIS/Decompile/Recompile and preplan for new trunk groups or trunk subgroups contain satellite trunk groups or trunk subgroups which are not due for turn up until after the PBC retrofit Generic has been loaded the BIT settling is accomplished by marking the SAT column of the B01 and B04 Form Codes for those trunks.

CAUTION: Make sure BIT 6 of the ITKTAB and BIT 1 of the first word in OTKTAB on all other non-satellite trunk groups or trunk subgroups are set to zero (0). If these BITs are left setting on one (1), non-satellite trunks interconnection of incoming trunk groups or trunk subgroups (ITKTAB) set to one (1) will not be made to outgoing trunk groups or trunk subgroups (OTKTAB) set to one (1).

8.04 Separate A-05 Form Codes must be prepared for each B04 Form Code prepared specifying those codes which may route terrestrial/satellite and those codes designated as requiring restrictive routing to select only terrestrial trunk groups or trunk subgroups. See Figure 9 for special handling of INWATS CODES when multi-part trunk groups are used.

8.05 Separate Peg Counts, Overflow and usage measurements will be made for the terrestrial and satellite trunk groups or trunk subgroups.

8.06 02A-C and 03A-C Form Codes must be revised and recent changes prepared to reflect routing of those codes requiring restrictive routing-

8.07 A trunk group or trunk subgroup which has codes, designated as requiring restricted routing, directed to the group and the group alternate routes to a trunk group or trunk subgroup with is made up of satellite circuits than that group must have a pseudo trunk group or trunk subgroup established and the designated codes directed to the pseudo group with an alternate route pattern built to avoid any satellite trunk group or trunk subgroup even though the original first route is not made up of satellite trunk group or trunk subgroup. (See Figure 6)

9. PROCEDURES FOR RESTRICTIVE ROUTING OF SELECTED CODES AT 4A ETS OR 4AETS/PBC WITH GENERIC ISSUE 8.1 TO 10.0 - Division 3A of the 4A ETS Translation Guide

9.01 Establish satellite circuits as a speparate trunk group or trunk subgroup from 1-way/2-way terrestrial trunk groups or trunk subgroups between the A and Z office.

A. A separate 01B Form Code must be prepared for each terrestrial and satellite trunk groups or trunk subgroups between the A and Z office.

B. Use the same 11 character CLLI code on the satellite trunk group or trunk subgroup as designated for the mate terrestrial trunk group or trunk subgroup.

C. Assign a suffix different than the suffix assigned to the mate terrestrial trunk group or trunk subgroup between the A and Z office.

D. Assign a distinct incoming screening class to all satellite trunk groups or trunk subgroups. This screening class must not be used for any other trunk group or trunk subgroup. Screening tables must be set up to provide screening of calls which arrive via the in coming satellite trunk group or trunk subgroup to prevent a double satellite connection to an outgoing satellite trunk group or trunk subgroup. These calls should be permitted to complete via terrestrial trunk groups or trunk subgroups.

E. Assign separate GB relays to the terrestrial and satellite trunk groups or trunk subgroups between the A and Z office.

1. A separate 04 Form Code must be prepared for each terrestrial and satellite trunk groups or trunk subgroups when the combined 1-way/2-way trunk group or trunk subgroup utilizes both the A and B (Col. 29-30) of the 04 Form Code. (Example G)

Example G (04 Form Code)

	Suffix (28)	Rank (29-30)	Register (53-55)
(Terrestrial)			
1-way/2-way	0	0A	001
(Satellite)			
2-way	1	0B	002

2. When the combined 1-way/2-way terrestrial trunk group or trunk subgroups are contained within one rank, for example Rank A, and the terrestrial circuit growth is not expected to exceed the requirement of a single rank the satellite trunk group or trunk subgroup may be placed in the B Rank. (Example H)

3. Establish a pseudo trunk group or trunk subgroup entries for the existing terrestrial trunk group or trunk subgroup using the same GB relay and Trunk Block Connectors currently assigned to the existing trunk group or trunk subgroup.

4. Prepare a separate 04 Form Code for the pseudo trunk group using the same CLLI as the working trunk group or trunk subgroup and assign a suffix different than the suffix currently assigned to the working terrestrial/satellite trunk group or trund subgroup. (See Figure 6, 7 and Example I)

Example I (04 Form Code)

	Suffix (28)	Rank (29-30)	Register (53-55)
(Terrestrial)			
1-way	0	0A	001
2-way	1	0B	002
(Satellite)			
2-way	2	1A	004
(Pseudo Terrestrial)			
1-way	3	0A	006
2-way	4	0B	008

9.02 Separate A05 Form Codes must be prepared for each 04 Form Code prepared specifying those codes which may route terrestrial/satellite and those codes designated as requiring restrictive routing to select only terrestrial trunk groups or trunk subgroups. See Figure 9 for special handling of INWATS CODES when multi-part trunk groups are used.

9.03 02A-C and 03A-C Form Codes must be revised and recent changes prepared to reflect routing of those codes requiring restrictive routing.

9.04 If form Codes are being prepared for a PBC/Decompile/Recompile and preplan for new trunk groups or trunk subgroups contain satellite trunk groups or trunk subgroups which are not due for turn up until after the PBC retrofit Generic has been loaded the BIT setting is accomplished by marking the SAT column of the B01 and B04 Form Codes for those trunks.

9.05 Separate Peg Counts, Overflow and usage measurements will be made for the terrestrial and satellite trunk groups or trunk subgroups.

9.06 A trunk group or trunk subgroup which has codes, designated as requiring restricted routing, directed to the group and the group alternate routes to a trunk group or trunk subgroup with is made up of satellite circuits then that group must have a pseudo trunk group or trunk subgroup established and the

designated codes directed to the pseudo group with an alternate route pattern built to avoid any satellite trunk group or trunk subgroup even though the original first route is not made up of satellite trunk group or trunk subgroup. (See Figure 7)

10. PROCEDURES FOR RESTRICTIVE ROUTING AT A NO. 4 ESS SWITCHING LOCATION

10.01. Establish satellite circuits as a separate trunk group or trunk subgroup from 1-way/2-way terrestrial trunk groups or trunk subgroups between the A and Z office.

A. Use the same 11 character CLLI Code on the satellite trunk group or trunk subgroup as designated for the mate terrestrial trunk group or trunk subgroup between the A and Z office.

B. Screening to prevent tandem satellite connections is accomplished through coding of trunk subgroup characteristic Form Codes 401A, B, and C column 45 (SAT) as satellite yes.

C. It may be appropriate to establish a distinct screening class for satellite trunk groups or trunk subgroups to assist in screening calls (codes) which should not access satellite circuits,

D. Routing Data Blocks (RDBs) Form Codes 405A, B, C and D must be set up for routing of those codes which are designated as requiring restricted routing to avoid satellite trunk groups or trunk subgroups. These Routing Data Blocks are in addition to the RDB's currently assigned for code routing and will contain the terrestrial routing